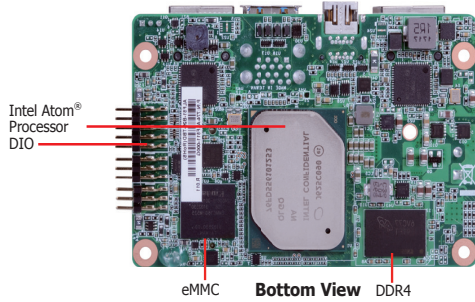
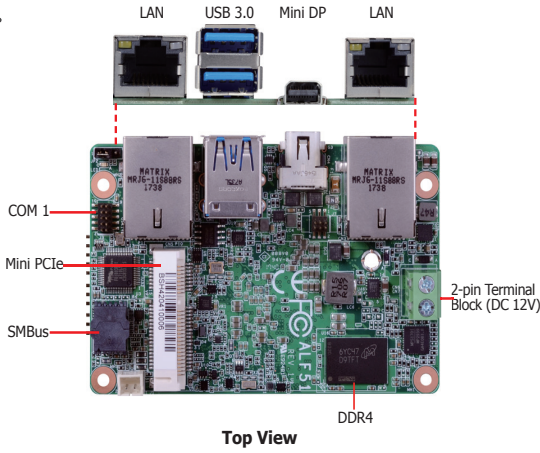




**Intel Atom® Processor E3900 Series  
1.8" SBC**



**ALF51**



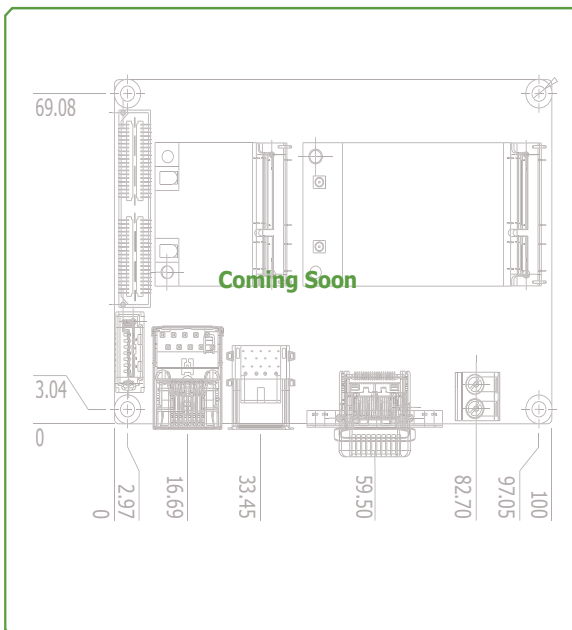
**Features**

- Small form factor 1.8" SBC for space-limited applications
- Single Channel LPDDR4 Memory Down up to 4GB
- DP++ resolution supports up to 4096x2160 @ 60Hz
- Expansion and Storage: 1 Mini PCIe, 1 SMBus
- Rich I/O: 2 Intel GbE, 1 COM, 2 USB 3.0, 1 USB 2.0

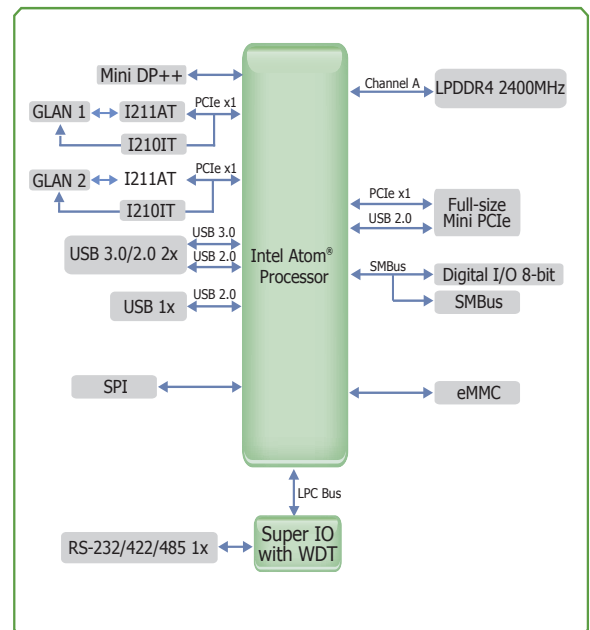
\* Populated by default



**Mechanical Drawing**



**Block Diagram**





**Specifications**

<b>SYSTEM</b>	<b>Processor</b>	Intel Atom® Processor E3900 Family, BGA 1296 Intel Atom® x5-E3940 Processor, Quad Core, 2M Cache, 1.6GHz (1.8GHz), 9.5W Intel Atom® x5-E3930 Processor, Dual Core, 2M Cache, 1.3GHz (1.8GHz), 6.5W
	<b>Memory</b>	2GB/4GB DDR4 Memory Down Single Channel LPDDR4 2400MHz
	<b>BIOS</b>	Insyde SPI 128Mbit (supports UEFI boot only)
<b>GRAPHICS</b>	<b>Controller</b>	Intel® HD Graphics
	<b>Feature</b>	OpenGL 4.2, Direct X 11.1, OpenCL 1.2, OGL ES 3.0 HW Decode: H.264, MPEG2, VC1, VP8, H.265, MPEG4 HW Encode: H.264, MPEG2, MPEG4
	<b>Display</b>	1 x Mini DP++ Mini DP++: resolution up to 4096x2160 @ 60Hz HDMI: resolution up to 3840x2160 @30Hz
<b>EXPANSION</b>	<b>Interface</b>	1 x Full-size Mini PCIe (PCIe/USB 2.0)
<b>ETHERNET</b>	<b>Controller</b>	2 x Intel® I211AT PCIe (10/100/1000Mbps) 2 x Intel® I210IT PCIe (10/100/1000Mbps) (available upon request)
<b>REAR I/O</b>	<b>Ethernet</b>	2 x GbE (RJ-45)
	<b>USB</b>	2 x USB 3.0
	<b>Display</b>	1 x Mini DP++
<b>INTERNAL I/O</b>	<b>Serial</b>	1 x RS-232/422/485 (1.25mm pitch, right angle type)
	<b>USB</b>	1 x USB 2.0 (1.27mm pitch)
	<b>DIO</b>	1 x 8-bit DIO
	<b>SMBus</b>	1 x SMBus
<b>STORAGE</b>	<b>eMMC</b>	1 x 16GB/32GB/64GB eMMC
<b>WATCHDOG TIMER</b>	<b>Output &amp; Interval</b>	System Reset, Programmable via Software from 1 to 255 Seconds
<b>SECURITY</b>	<b>TPM</b>	Available Upon Request
<b>POWER</b>	<b>Type</b>	Single 12V +/-10% DC
	<b>Connector</b>	2-pin Terminal Block
	<b>RTC Battery</b>	CR2032 Coin Cell
<b>OS SUPPORT (UEFI Only)</b>	<b>Microsoft/Linux</b>	Windows 10 IoT Enterprise 64-bit Ubuntu 16.04
<b>ENVIRONMENT</b>	<b>Temperature</b>	Operating: 0 to 60°C (Option: -20 to 70°C / -40 to 85 °C) Storage: -40 to 85°C
	<b>Humidity</b>	Operating: 5 to 90% RH Storage: 5 to 90% RH

**Ordering Information**

Model Name	P/N	Processor	Memory	eMMC	Display	GbE	RS-232/422/485	USB 3.0	USB 2.0	Power	Thermal	Temp.
<b>ALF51-BN-23E30</b>	770-ALF511-100G	X5-E3930	2 GB	32 GB	Mini DP++	2	1	2	1	12VDC	Fanless	0 to 60°C
<b>ALF51-BN-23E40</b>	770-ALF511-000G	X5-E3940	2 GB	32 GB	Mini DP++	2	1	2	1	12VDC	Fanless	0 to 60°C
<b>ALF51-EN-23E30</b>	770-ALF511-400G	X5-E3930	2 GB	32 GB	Mini DP++	2	1	2	1	12VDC	Fanless	-20to 70°C

**Packing List**

• 1 ALF51 board	
• 1 Serial ATA data cable (Length: TBD)	TBD
• 1 Heat spreader (Height: 11mm)	TBD

**Optional Items**

• USB port cable (Length: TBD)	TBD
• 1 COM port cable	TBD
• Power adapter (60W, 12V)	TBD
• Heat sink (Height: TBD)	TBD

## Assured Systems

Assured Systems is a leading technology company with over 1,500 regular clients in 80 countries, deploying over 85,000 systems to a diverse customer base in 12 years of business. We offer high-quality and innovative rugged computing, display, networking and data collection solutions to the embedded, industrial, and digital-out-of-home market sectors.

### US

[sales@assured-systems.com](mailto:sales@assured-systems.com)

Sales: +1 347 719 4508  
Support: +1 347 719 4508

1309 Coffeen Ave  
Ste 1200  
Sheridan  
WY 82801  
USA

### EMEA

[sales@assured-systems.com](mailto:sales@assured-systems.com)

Sales: +44 (0)1785 879 050  
Support: +44 (0)1785 879 050

Unit A5 Douglas Park  
Stone Business Park  
Stone  
ST15 0YJ  
United Kingdom

VAT Number: 120 9546 28  
Business Registration Number: 07699660